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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/393,768	09/10/1999	EROL BASTURK	239603PL-011	3272

24739	7590	12/11/2003

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EXAMINER
FERRIS, DERRICK W

ART UNIT	PAPER NUMBER
2663	

13

DATE MAILED: 12/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	09/393,768	BASTURK ET AL.
	Examiner	**Art Unit**	
	Derrick W. Ferris	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>21 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9-18,21,23 and 25-34* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9-18,21,23 and 25-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 September 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .   6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 11/21/2003 has been entered.

Response to Amendment

2.   **Claims 1-4, 9-18, 21, 23, and 25-34** as amended are still in consideration for this

application.   Applicant has canceled claims 5-8, 19, 20, 22, and 24. Applicant has amended

claims 1, 12, 18, 21, 23, 25, and 28.

3.   Examiner **withdraws** the obviousness rejection to *Hsu* in view of *Viswanathan* for Office

action filed 11/21/03. In particular, the rejection is withdrawn and replaced with a new rejection

that further clarifies a normalized tag/function. Applicant notes the three same items of issue: (1)

replace the tag of the packet with an updated tag, (2) a normalized tag/function, and (3)

randomized packet routing. At first issue, although *Hsu* supports MPLS [e.g., column 5, line 8],

Hsu is generally silent to replacing and updating an MPLS tag (i.e., the reference focuses on the

routing aspect leaving the particulars of how labels are swapped to techniques well known in the

art). *Viswanathan* cures the deficiency by disclosing replacing the tag of the packet with an

updated tag for MPLS as is well known in the art (page 167, right-hand column). In particular,

"*At subsequent nodes, the label is used as an index into a table which specifies the new outgoing*

label and next hop. The old label is replaced with the new, and the packet is forwarded to the

next hop". Applicant further argues that the combined reference teaches swapping an old MPLS

label with a new MPLS label as opposed to creating a new MPLS label for a non-MPLS packet

(i.e., a tag that does not arrive for processing as an MPLS packet as mentioned in applicant's

remarks filed 11/21/03 on page 10, first paragraph). Examiner notes the concept above is not

recited in the claims. Also, examiner did not find any support in applicant's specification for

creating a new MPLS label for a non-MPLS packet.

At second issue is where the normalizing function f_N and randomizing function f_R allows

one to more fully utilize the resources of the system (applicant's specification on page 9, lines

17-18). Applicant in general recites that a normalized tag is created using a normalized function

(i.e., $T_N=f_N(T)$). Examiner notes a reasonable but broad interpretation of a normalized tag and

function. Examiner notes that an MPLS tag/label is a normalized tag as is known in the art. In

particular, *Viswanathan* shows a shim header of 20 bits (figure 1 on page 167), which is smaller

than a typical 32-bit address used to route IP packets as is known in the art. It appears from

applicant's remarks filed 11/21/03 that the above interpretation may be improper. As such

examiner has also provided another interpretation by supplying *Wildford* as an additional

reference. In particular, *Wildford* discloses an enhanced Internet packet routing lookup for either

IP or MPLS packets (i.e., a tag that does not arrive as an MPLS packet and a tag that arrives as

an MPLS packet). Specifically, for figure 2, step 226, *Wildford* discloses that the routing table

lookup involves generating a hash key (i.e., normalized Tag T_N) from the routing information

(i.e., Tag T) and using the hash key (i.e., normalized Tag T_N) to index to routing table lookups

[column 5, lines 44-50]. Thus *Wildford* discloses using a hash key where by definition a hash

(coding) reduces the number of bits involved in access routing information. By using a hash the network performance is enhanced since the number of bits used in the lookup is reduced.

At third issue, examiner notes a reasonable but broad interpretation of "randomizing packet routings" as recited in at least claims 10, 13, 26, and 29. Examiner notes using a reasonable but broad interpretation of "randomizing", the limitation is also taught by *Hsu*. *Hsu* teaches a constraint-based route selection technique that supports establishing Multi-protocol Label Switching (MPLS) label switched paths through explicit routing [column 2, lines 66-67; column 3, lines 1-2]. Examiner notes that although explicit routing is disclosed, hop-by-hop routing is further supported [column 6, lines 37-44]. In particular, *Hsu* discloses a randomizing function with respect to load balancing [column 12, lines 31-40; column 13, lines 4-22]. Specifically that the multi-class technique attempts to offer a greater diversification on the multi-paths [column 13, lines 20-22]. In addition, *Hsu* also supports Optimized Multipath (OMP) for load balancing on a hop-by-hop basis (i.e., "hop-by-hop routed LSPs") [column 8, lines 12-36]. (In addition, see also Explicit Routing as taught by *Viswanathan* on page 170 with respect to load balancing.) Thus "randomizing packet routings" is taught using a reasonable but broad interpretation.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   **Claims 1-4, 9-18, 21, 23, and 25-34** are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 6,363,319 B1 to *Hsu* in view of "Evolution of Multiprotocol

Label Switching" to *Viswanthan et al.* ("*Viswanathan*") and in further view of U.S. Patent No.

6,512,766 B2 to *Wildford*.

As to **claims 1, 18, 21 and 23,** *Hsu* discloses a method and apparatus for selecting

a route for a flow from a plurality of network paths connecting a source to a destination

[Abstract]. More specifically, *Hsu* discloses constraint-based route selection using biased

cost. Shown in figure 1a are routers using a centralized biased cost route selector

(BCRS) and shown in figure 2 are routers using a distributed biased cost route selector

(BCRS) using label edge routers (LERs) [column 3, lines 32-38]. With respect to a first

and second node, examiner notes figure 3 illustrating a directed graph index [column 5,

lines 25-67; column 6, lines 1-8]. Examiner notes that MPLS is known in the art for

packet forwarding [column 1, lines 15-16]. *Hsu* also discloses using a loop free

algorithm (i.e., acyclic as defined by applicant on page 5, lines 3-4).

The *Hsu* reference is generally silent or deficient to the limitation of replacing the

tag (i.e., MPLS label) of the packet with the updated tag to give an updated packet.

Examiner notes that it would have been obvious to a skilled artisan to replace the tag (i.e.,

MPLS label) when routing/switching the packet in the MPLS network. Examiner notes

that further support or motivation comes from *Viswanathan* which discloses that a packet

is "labeled" by either encoding the label in the data link layer or network layer header, or

encapsulating the packet with a header specifically for MPLS [page 167, bottom right-

hand column]. Thus *Viswanathan* cures the deficiency by disclosing replacing the tag of

the packet with an updated tag for MPLS. In addition, *Hsu* and *Viswanathan* may be silent or deficient to using a normalizing function to the tag where the normalizing function enhances network performance by reducing the number of bits involved in accessing the routing table bias table. Examiner notes that it would have been obvious to one skilled in the art prior to applicant's invention to use a normalizing function to the tag where the normalizing function enhances network performance by reducing the number of bits involved in accessing the routing table bias table. One skilled in the art would be motivated to use a hashing function to reduce/normalize the number of bits involved in accessing the routing table bias table since a hash reduces the number of bits needed to lookup a route in a routing table. As such, *Wildford* cures the above-cited deficiency by disclosing in figure 2, step 226 that the routing table lookup involves generating a hash key (i.e., normalized Tag T_N) from the routing information (i.e., Tag T) and using the hash key (i.e., normalized Tag T_N) to index to routing table lookups [column 5, lines 44-50]. Thus *Wildford* discloses using a hash key where by definition a hash (coding) reduces the number of bits involved in access routing information.

As all three reference disclose routing packets in general, and more specifically routing packets using MPLS, examiner notes a strong motivation to combine the subject matter as a whole for all three references.

As to **claim 2**, both references disclose transporting the packet to a destination node, using a reasonable but broad interpretation, where applicant defines destination node as either a terminal or a router on page 8, lines 10-11 of applicant's specification.

For example, as shown in figure 2 of *Viswanathan* and on page 168 bottom right-hand column.

As to **claim 3**, *Hsu* discloses routing an MPLS packet in general over a directed graph network. Again, *Hsu* is deficient or silent to how a label is changed at an intermediate node. Examiner notes that it would have been obvious to a skilled artisan prior to applicant's invention to change a label at an intermediate node. Again, *Viswanathan* provides additional support by disclosing that a label can be swapped at intermediate (i.e., subsequent) nodes [page 167, bottom right-hand column].

As to **claim 4**, see the same reasoning behind the rejection to claim 2.

As to **claim 33**, see the same reasoning behind the rejection for claim 1 (and as shown in figure 3 of *Hsu*).

As to **claims 9 and 25**, both reference disclose using an updating function throughout the network.

As to **claims 10-11 and 26-27**, examiner notes using a reasonable but broad interpretation of "randomizing", the limitation is also by *Hsu*. *Hsu* teaches a constraint-based route selection technique that supports establishing Multi-protocol Label Switching (MPLS) label switched paths through explicit routing [column 2, lines 66-67; column 3, lines 1-2]. Examiner notes that although explicit routing is disclosed, hop-by-hop routing is further supported [column 6, lines 37-44]. In particular, *Hsu* discloses a randomizing function with respect to load balancing [column 12, lines 31-40; column 13, lines 4-22]. Specifically that the multi-class technique attempts to offer a greater diversification on the multi-paths [column 13, lines 20-22].

As to **claims 12 and 28**, see the rejection for claim 9.

As to **claims 13-14 and 29-30**, see the rejection for claims 10-11.

As to **claims 15-16 and 31-32**, *Viswanathan* discloses the general concept of using a general packet between source and destination which may occur between one or more intermediate nodes. *Hsu* provides additional support by disclosing a flow of a packet (i.e. FIFO packet flow).

As to **claims 17 and 34**, *Viswanathan* discloses matching variable bits for a label using a broad but reasonable interpretation of hash.
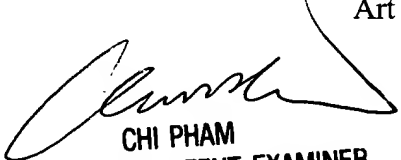
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-3900.

Derrick W. Ferris
Examiner
Art Unit 2663

DWF

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TECHNOLOGY CENTER 2600   12/8/03